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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,684	03/25/2004	Jeffrey Peter Allen	05046-00042	6186
22910	7590	09/11/2007	EXAMINER	
BANNER & WITCOFF, LTD. 28 STATE STREET 28th FLOOR BOSTON, MA 02109-9601			CANTELMO, GREGG	
		ART UNIT	PAPER NUMBER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/808,684	ALLEN, JEFFREY PETER
	Examiner Gregg Cantelmo	Art Unit 1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 01 August 2007.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-4,9-11,13-15 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-4, 9-11, 13-15 and 17-19 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment received August 1, 2007:
 - a. Claims 1-4, 9-11, 13-15 and 17-19 are pending;
 - b. The 102 rejection of WO '060 is withdrawn;
 - c. The prior art rejections to JP '529 stand.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 9-10, 13, 15, 17 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 08-153529 A (JP '529).

JP '529 discloses an electrolyte delivery device, a fuel cell assembly comprising the electrolyte delivery device and a method of supplying electrolyte to the fuel cell comprising: an electrolyte reservoir 26 and/or 27, a fluid conduit in communication with the reservoir to provide electrolyte to the device requiring the electrolyte, a heating device 29 and a pressure generator defined by valve 25 which uses gas from line 18a to force electrolyte from the reservoir (Fig. 2 as applied to claims 1, 3, 13 and 19). The heater 29 is a coiled resistive heater (Fig. 2 as applied to claim 2). The fuel cell is a molten-carbonate fuel cell (MCFC, abstract as applied to claim 8). Each of the anode and cathode include nickel in the catalyst material (paragraph [0024] as applied to claim

9). The heater 29 is a resistive heater and positioned about the reservoir and a portion of the fluid conduit (Fig. 2 as applied to claim 10). Opening of the Bulbs 25 and 28 provide a condition which indicates operative flow of the pressurized gas from inlet line 18a through to the electrolyte reservoir 26. This in conjunction with positive electrolyte flow from the reservoirs 26/27 into the fuel cell constitutes a means for showing or detecting the flow of the pressurized gas (Fig. 2 as applied to claim 15). Bulb 25 is controlled inherently by either automated means or by a human user and upon opening of the bulb 25 to permit flow of gas along the line attached to the bulb will represent a positive activation of the pressure generator to the reservoirs 26 and 27 (Fig. 2 as applied to claim 17). The electrolyte is delivered to a molten carbonate fuel cell (Fig. 2 as applied to claims 20 and 21).

Regarding the limitation of delivering electrolyte during operation of the fuel cell:

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). See also MPEP § 2114.

The manner of operating the device does not differentiate an apparatus claim from the prior art. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

The prior art apparatus is capable of performing the same functionality and has the same structure as the claimed apparatus, thus the apparatus of JP '529 is held to anticipate the claimed apparatus.

Furthermore the claims fail to define the extent of the claimed fuel cell operation thus replenishing of the electrolyte to the system regardless of whether or not the fuel cell is generating power is considered to be an operational state of the fuel cell apparatus and method (as applied to claims 1, 13 and 19).

Response to Arguments

4. Applicant's arguments filed August 1, 2007 have been fully considered but they are not persuasive.

As discussed above, JP '529 teaches of the same apparatus as that of the claims in the rejection above. The prior art apparatus is capable of performing the same

functionality and has the same structure as the claimed apparatus, thus the apparatus of JP '529 is held to anticipate the claimed apparatus.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '529.

The teachings of JP '529 have been discussed above and are incorporated herein.

JP '529 is silent as to the particular material of the various lines and conduits.

The use of stainless steel lines would have been readily apparent to one of ordinary skill in the art since it would have provided a material which is corrosion resistant to the electrolyte and also has good thermal conductivity, the latter would have been significant in the region proximate to the resistive heater 29 to ensure complete

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melting of the electrolyte prior to introducing it into the fuel cell. The selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '529 in view of U.S. Patent No. 6,322,916 (Hemmes).

The teachings of JP '529 have been discussed above and are incorporated herein.

JP '529 does not teach of a fuel cell stack however such a modification would have been readily apparent to one of ordinary skill in the art.

The number of fuel cells within the stack determines the total voltage of the stack, and the surface area of each of the cells determines the total current. The total electrical power generated by a given fuel cell stack can be determined by multiplying the total stack voltage by total current. Additionally Hemmes teaches of MCFC stacks and that fuel cell stacks are generally known in the art. In said fuel cell stack the cathode and the anode of successive fuel cells are separated by means of a separator plate made, for instance, from stainless steel. By means of such a fuel cell stack a greater capacity can be achieved, respectively connecting the individual fuel cells in series will result in a higher voltage (col. 2, ll. 45-52).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '529 by incorporating the

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fuel cell disclosed therein into a fuel cell stack since it would have provided a power source have a greater electrical power to meet the demand of higher load electrical devices.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '529 in view of U.S. Patent No. 5,426,002 (Matsumura).

The teachings of JP '529 have been discussed above and are incorporated herein.

JP '529 does not teach of using a thermocouple in thermal communication with the electrolyte reservoir.

However it is apparent that JP '529 monitors or requires a minimum temperature to the electrolyte so as to ensure that the electrolyte is in a molten state. Use of temperature sensors, including thermocouples, is conventionally known as a means for providing temperature feedback of a device or environment (see Matsumura, col. 3, ll. 13-30).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '529 to provide a thermocouple in thermal communication with the electrolyte reservoir of JP '529 since it would have provided a means for effectively monitoring the temperature of the electrolyte to ensure that the electrolyte temperature was sufficient so as to place it in a molten state.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '529 in view of JP 64-030170 A (JP '170).

The teachings of JP '529 have been discussed above and are incorporated herein.

JP '529 does not teach of providing a timer to deactivate the pressure generator after a certain period of time.

However either a controller (automated or human) operates the bulbs 25 and 28 and thus opens and closes the bulbs as needed. Thus the controller which controls these bulbs themselves could serve as timers, selecting a desired operating time as needed for running and then terminating the electrolyte replenishment portion of the fuel cell system. In addition, JP '170 discloses monitoring the power output of the fuel cell and upon a decrease in the output below a threshold level, a signal is sent to replenish electrolyte to the fuel cell. It would further be understood that once the power outputs are increased to the requisite level that electrolyte replenishment would no longer be required and thus terminated.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '529 by providing a controller to control the time at which the electrolyte replenishment is activated as well as a control response time at which the replenishment is terminated to improve the efficiency of the electrolyte replenishment system and fuel cell system.

10. In the alternative, claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '529 in view of JP 64-030170 A (JP '170).

While the claim fails to explain the extent of the claimed operation of the fuel cell and in the broadest sense, JP '529 is held to anticipate the generic term "operation", it is

further obvious to force electrolyte into the fuel cell while the fuel cell is operating to generate power.

JP '529 discloses an electrolyte delivery device, a fuel cell assembly comprising the electrolyte delivery device and a method of supplying electrolyte to the fuel cell comprising: an electrolyte reservoir 26 and/or 27, a fluid conduit in communication with the reservoir to provide electrolyte to the device requiring the electrolyte, a heating device 29 and a pressure generator defined by valve 25 which uses gas from line 18a to force electrolyte from the reservoir (Fig. 2 as applied to claims 1, 3, 6-7, 13 and 19).

JP '529 does not teach of providing additional electrolyte while the fuel cell is generating electrical power.

However either a controller (automated or human) operates the bulbs 25 and 28 and thus opens and closes the bulbs as needed. Thus the controller which controls these bulbs themselves could serve as timers, selecting a desired operating time as needed for running and then terminating the electrolyte replenishment portion of the fuel cell system. In addition, JP '170 discloses monitoring the power output of the fuel cell and upon a decrease in the output below a threshold level, a signal is sent to replenish electrolyte to the fuel cell. It would further be understood that once the power outputs are increased to the requisite level that electrolyte replenishment would no longer be required and thus terminated.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '529 by providing a the

electrolyte replenishment system of JP '170 since it would have improved the operational efficiency of the electrolyte replenishment system in the fuel cell system.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


gc
September 4, 2007

Gregg Cantelmo
Primary Examiner
Art Unit 1745